



New Hampshire Environmental Health Tracking Program

Pilot Data Exchange for Drinking Water and Public Health Impacts

Flow Configuration Document

Version 1.0

February 20, 2006



Document Purpose

The Flow Configuration Template presented here is intended to standardize the environmental or health information data exchange that will be defined by each participating agency. Participants in this pilot project include the NH Department of Environmental Services (DES), the NH Department of Health and Human Services (DHHS), and the NH Office of Information Technology (OIT). During the Pilot stage, each partner will implement the Data Services for their respective environmental data (i.e. drinking water) or public health data (e.g. hospital, cancer, birth outcomes, etc.) in order to link information that may demonstrate important spatial or temporal associations in New Hampshire. The physical transfer of data will occur via a hardware-software system called the NH Environmental Health Data Integration Network (EHDIN).

Intended Audience

This document is intended to be a guide for the State staff of the participating agencies in order to define the Data Services for the DES/DHHS pilot project. The document may also assist other non-participating entities such as national Centers for Disease Control (CDC) and the regional Environmental Protection Agency (EPA) to implement a similar Pilot data exchange project.

Project Background

The NH Environmental Health Tracking Program has been funded for the past four years via a CDC cooperative agreement to develop a system to exchange data and resources between state and local agencies. The primary ‘product’ will be a hardware-software interface for the ongoing, standardized and automated movement of compatible data sources. Implementing an automated Data Flow between environmental and health information will improve the ability to describe environmental health issues and respond to events that affect important public health issues. We believe this pilot project will act as a ‘proof of concept’ to demonstrate the feasibility and cost-benefits of linked data sets.

New Hampshire agencies have a long history of working on these types of data exchange demonstration projects. Examples include participation in the Environmental Protection Agency’s (EPA) CDX projects including; Node Beta, Node 1.0 workgroup, and the Drinking Water Challenge Grant. In each of these cases, the projects were successful and furthered the efforts of the EPA Exchange Network effort to standardize and automate complex data sets for mandated reporting needs. New Hampshire is prepared to allocate an OIT Business Analyst for a period not to exceed 1 year, in order to complete the project. New Hampshire will be produce a number of key written products, including 1) a System Design document to implement the data exchange, 2) a Lessons Learned document (detailing stakeholder needs, resources, data sets, AVR, security, metadata, etc.) and 3) a Best Practices document to further the effort of other states.

Improve Data Quality

This is a high priority project for DES/DHHS programs that collect, store and transfer data. Requests for timely and complete analytical environmental and health information are dramatically increasing for both the public and private sectors. Developing a transparent transfer of analytical data provide the following benefits:

- Improved understanding of drinking water, human health, and the distribution of critical resources to the citizens of New Hampshire.

- Storage of linked environment and health data sets in a common space.
- Standardization of data fields across agencies with differing missions
- Automation of data transfer
- Improved access to important data sets on pollutants, exposures and health effects
- More timely and rapid reporting of critical information to stakeholders.
- Reduction of data entry errors often produced during human transcription
- Reduction in labor costs currently spent on manual data collection & entry
- Reduction in paper usage; many emailed, posted or faxed reports can be eliminated
- Improved data analysis, visualization and reporting (AVR) tools
- Improved data dictionary, metadata, and ability to query for specific information
- Controlled transfer of data on environmental hazards; exposures to hazards; and health effects.
- Real-time data exchange can provide information for making rapid decisions during natural disasters, chemical spills, and bioterrorism events.
- Automated data transfer will reduce or eliminate cumbersome data format conversions, or the manual caring of static storage disks between departments.
- Potential for improvements to existing state web services such as the DES One-Stop website, or the DHHS Birth Query website.

In addition, this project potentially offers a solution to access issues that have resulted from homeland security policies. DHHS and DES agencies are challenged by the paradox of needing increased public reporting to fulfill basic legal/programmatic requirements, yet restrained from releasing pollution/hazard data due to homeland security concerns. The role-based registration process and account management component may help to alleviate this issue by authorizing access to sensitive data sources.

The final reason that this is a high priority project is to comply with the terms of the CDC grant and fulfill the requirements of the cooperative agreement for continued development of important environmental health infrastructure in New Hampshire.

Develop Data Exchange

The State of NH intends to improve data sharing, data use, and to provide more consistent information across the state. To accomplish this, the data needs to be available to the individual departments and local municipalities more quickly so that they can address environmental quality issues as soon as possible. Therefore, DHHS & DES are proposing a project that will allow use of the National Environmental Information Exchange Network (NEIEN) to exchange Community Drinking Water XML data flows, not just with EPA, but also between our state departments. We are proposing to implement a functioning data exchange network that captures environmental data and link it with health data in a manner that allows for easy comparison of temporal and geographic trends in an ongoing, surveillance-oriented system.

Environmental data priorities - Our first objective is to identify and exchange a high quality source of electronic data for community drinking water system. The target data set exists within the NH DES as the 'Drinking Water Database' within the Water Supply Engineering Bureau. In subsequent pilots we would like to exchange indoor air radon data, indoor air quality, AQS data.

Health data priorities - Our first objective is to identify and exchange hospital outpatient data (i.e. emergency room visits). The target data set exists within the NH DHHS as the 'Automated Hospital Emergency Department' (AHED) database within the DHHS Health Statistics Unit. In subsequent pilots we would like to exchange cancer registry data and birth defects data.

Data Integration

Exchanged data will be integrated by using established data flows within Environmental Services. First, “remote” data will be acquired using web services this has already been established and implemented. The Drinking Water program in DES has successfully transferred data to the Environmental Protection Agency via the Federal Reporting Schema in XML format. This pilot will leverage that existing flow of data and by using that schema which is listed in Appendix A. Currently the existing data flow accepts input date to extract the data from the Drinking Water program. These dates can be expanded to allow for a greater range of data to be returned.

Parameters

SampleCollectionStartDate	Required	Used to indicate the starting date for which data collection activities should be retrieved. This will be in the YYYYMMDD format.
SampleCollectionEndDate	Required	Used to indicate the ending date for which data collection activities should be retrieved. This will be in YYYYMMDD format.
SubstanceIdentifier (Analyte)	Optional	Comma separated listing of substances. If left blank, then requesting all parameters. This dataexchange will use parameter codes that have been defined by Drinking Water Grant.
EPA Identifier	Optional	Used to identify specific Drinking Water Facility. This will be a 7 digit number to identify existing sites

Expected Return

The return of this web service call will be an XML instance document conforming to the FEDREP XML Schema (see Appendix A for a listing of accepted code values.)

Basic Site Information

Water System Name
Type of Water System
Retail Population Served
WholeSaleroFWater
Address
City
Telephone Number

Violation Information

Water System Name
Violation ID
Violation Type
Contaminant Code
Compliance Period Begin Date
Compliance End Date

Analysis Result
Level Violated

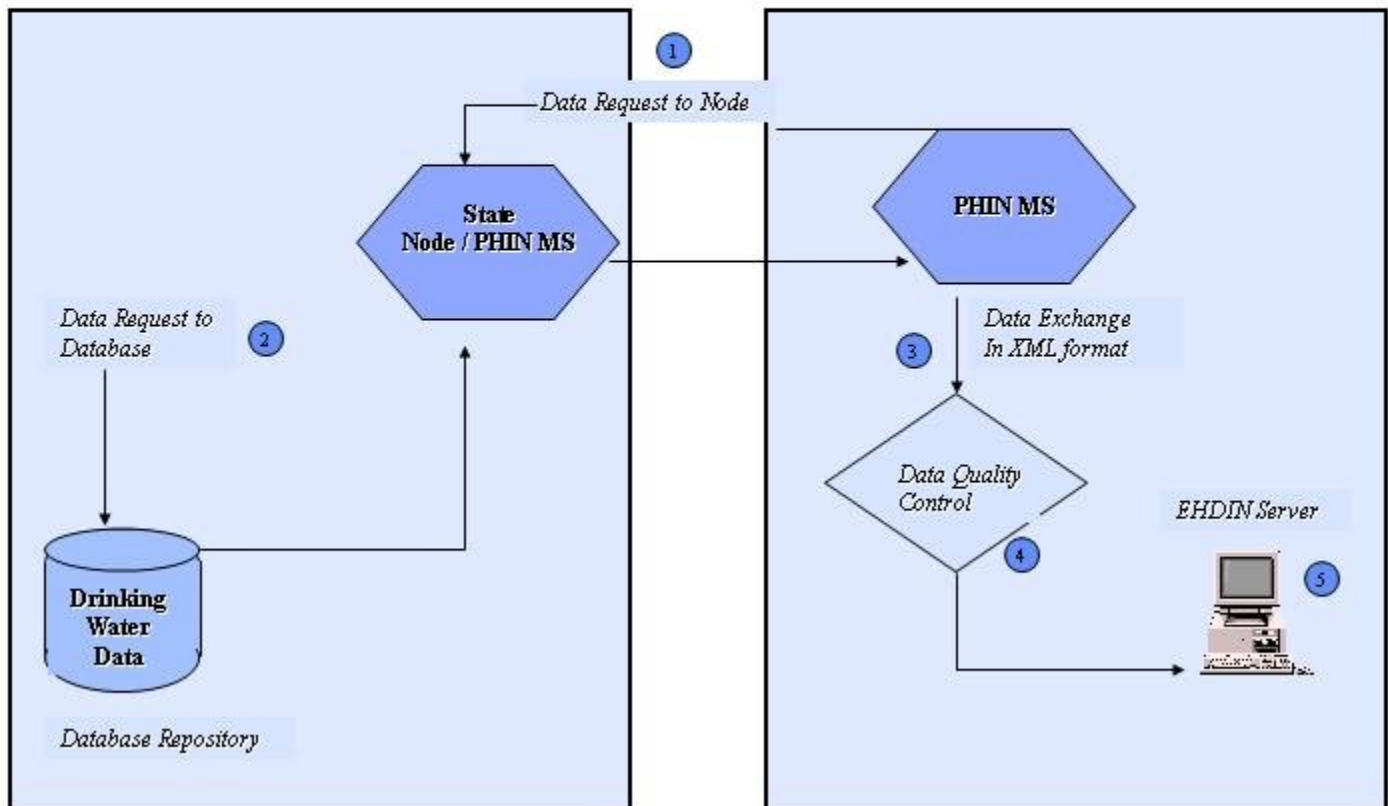
Sample End Date
Sample Collection Date
Sample Contaminant
Sample Result Sign
Sample Analysis Result
Unit of Measure

Sample information

Sample Id
Facility ID
Sample Begin Date

This web services call is one of the principle tools of the exchange network. A simple application will bring together the monitoring data from multiple sources for immediate analysis by professional staff. This will demonstrate a quick success for data integration. Secondly, using the same principles and tools coupled with additional queries, we will gain access to historic data, and permit storage in a Drinking Water data repository. Thus a virtual, repository of quality assured data, useful for long-term trend analysis will exist, this data will be stored in the EHDIN server and will be available for query via the WEB.

Proposed Data Exchange between DES & EHDIN Systems



Flow Management and Workflow

1. The User Web Interface will allow the user to enter a date range they wish to retrieve for The EDIN PHIN computer will send a message to the DES PHIN computer via the
2. The DES PHIN computer will receive the message into the [Message Receiver](#)
3. From the Message Receiver the message handler will pick up the message
4. Drinking water data will be available on the oracle database this database will accept queries from the DES PHIN computer.
5. Currently the Oracle Database Stored procedure accepts dates as an input range for pulling the drinking water data from the database. The DES PHIN computer will execute the store procedure based off this date range.
6. This drinking water selected data will be sent to the requestor the DES PHIN computer. This data will be in well formed XML meeting the shema for EPA Drinking water exchange.
7. Once received by the DES PHIN computer it will be stored in the

1. Data Request:

- EHDIN will have a User WEB interface will be available to the Client for the purpose of inputting [StartDate](#) and [EndDate](#) and [Analyte code](#). This will be an attachment that will be transmitted to the PHIN system
- EHDIN makes a data request to NHDES database via the PHIN node. Using the PHIM computer will send a message to the DES PHIN computer via [Message Sender](#) This message will have a embedded message wich will be the execution o be able to make data request to the NHDES Node. This node client will also be able to schedle the process the process of pulling data from the database repository of NHDES.

2. Data Request Processing:

New data flows will be developed and plugged into the NHDES node based on the list of flows that are chosen for implementation. Anytime the NHDES node receives a data request, it will retrieve data from the data base repository corresponding to theat data flow and generate an XML instance daocument. For the data exchange to be successful, the database whould be accessible to the node.

3. Data Response in XML:

The data will then be spit out in XML formation based on the Homeland Security Health and environmental data exchange XML schema that will be designed during the d

4. EPHT Data quality control:

The received data will then be reviewed and the data quality will be evaluated throught he use of data quality control procedures.

5. Data Storage:

Once the data passes all quality measures, the data will be moved to production server and inserted into tables under the database. From there the data will be linked to health data and presented in web format to clients of the network.

PHIN MS

PHIN targets the support and integration of systems for disease surveillance, national health status indicators, data analysis, public health decisions support, information resources and knowledge management, alerting and communications and the management of public health response. The major thrust of PHIN is to connect the many organizations and functions of public health to create a reliable, information network capable of supporting the current and emerging needs of public health. This network of capable information systems will be built from existing initiatives and software systems that are supportive of the PHIN functional Areas. These PHIN component initiatives are considered national in scope and support better public health practice through integrated systems.

Critical Steps in becoming certified PHIN

It is hoped that one outcome of the pilot project is a better understanding of PHIN and the features and components on how it will interface with the rest of the CDC Network. We hope that both participants in the project will become certified as Nodes on the network. NH DES will certainly use this to exchange information with other states around the Nation..

Process steps for Keys Performance Measure (PPM) Certification

- Download and review technical documentation from the PHIN website, including
 - KPM specifications and implementation Guides – Need new name for this
 - KPM test scenarios
- Use online PHIN self-assessment tools
 - Access online automated tools for validation of message exchange KPMs
 - For Alerting KPMs, download and complete self-assessment questionnaires
- Demonstrate KPM Implementation
 - For message exchange KPMs provide valid message(s) to certification team
 - For alerting KPMs provide a demonstration or complete documentation of the solution to show the functionality to the certification team. An example of this would be to:
 - Provide an alert and confirm its delivery to a specific role within a defined time frame based on the urgency level of the communication
- Review and assess results
 - Evaluate message validation for
 - Format
 - Conditionality
 - Vocabulary
 - Content – based on test scenarios
 - For alerting KPMs, evaluate KPM based on a demonstration or complete documentation of the capability to be certified
 - Conduct phone interview to discuss results
- Document certification results
 - Provide official Certification documentation to the awardees
 - Setup teleconference to review status report as necessary.

Major Components that will be utilized

Message Receiver Handling Modes

In the Messaging system 2.0 the message Receiver supports asynchronous and synchronous message handling modes. You can implement either or both handling modes.

Synchronous Handling Mode

Synchronous message handlers are usually servlets. However, they can also be implemented as other web programs such as ASP and CGI scripts. In synchronous handling mode the Message Receiver performs the following operations:

1. Receives an incoming message from the message sender.
2. Parses the incoming message envelope.
3. Maps the service and action attributes on the message envelop to a message handler's URL.
4. Post the message payload to the message handler's URL.
5. Sends the transport and application status to the message sender that sent the incoming message.

Asynchronous Handling Mode

In the asynchronous handling mode the message receiver performs the following operations:

1. Receives an incoming message form the message sender.
2. Parses the incoming message envelope.
3. Maps the service and action attributes to one or more worker queues.
4. Drops the payload and Meta data into the worker queue.
5. Sends a transport status back to the message sender.

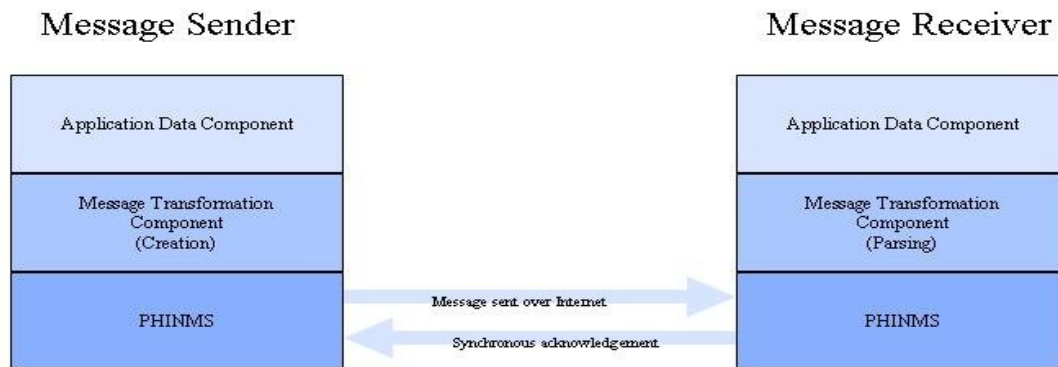
Afterward an asynchronous message handler application polls its worker queue to receive the incoming message.

Combination Handling Modes

The message receiver can simultaneously accommodate the asynchronous and synchronous handling modes.

To use a combination of both handling modes the message receiver does the following:

1. Receives an incoming message from the message sender.
2. Parses the incoming message envelope, decrypts the payload and then verifies the signature.
3. Looks in the **servicemap.xml** file for an entry that corresponds to the service and action attributes in the envelope of the incoming message.
4. Determines whether the entry type is **servlet** or **workerqueue**.
5. If the entry type is **servlet** the message receiver does the following:
 - a. Sends the payload to a message handler.
 - b. Waits for a response from the message.
 - c. Sends a synchronous response to the message sender, which includes the transport and application status.
6. If the entry type is workerqueue, the message receiver writes the payload to a set of worker queue, which are defined in the servicemap.xml file, and then it sends a synchronous response to the message sender, which contains only the transport status.



Major Components



Network Exchange

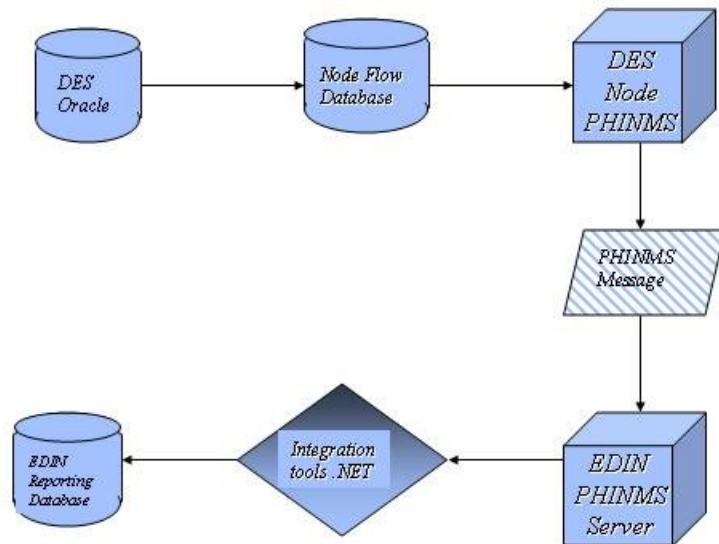
For the pilot project, the flow of data between DES and EDIN will be unidirectional with the EHDIN web services putting in parameters this message will be processed by PHIN and sent to DES Node PHIN where the message will be decrypted and web services will process the incoming message then the information will be repackaged and sent back to the PHIN and sent back to the EHDIN PHIN system. Once the data is received by PHIN it will be inserted into the MS SQL database the XML data will inserted into the EHDIN system.

Objectives

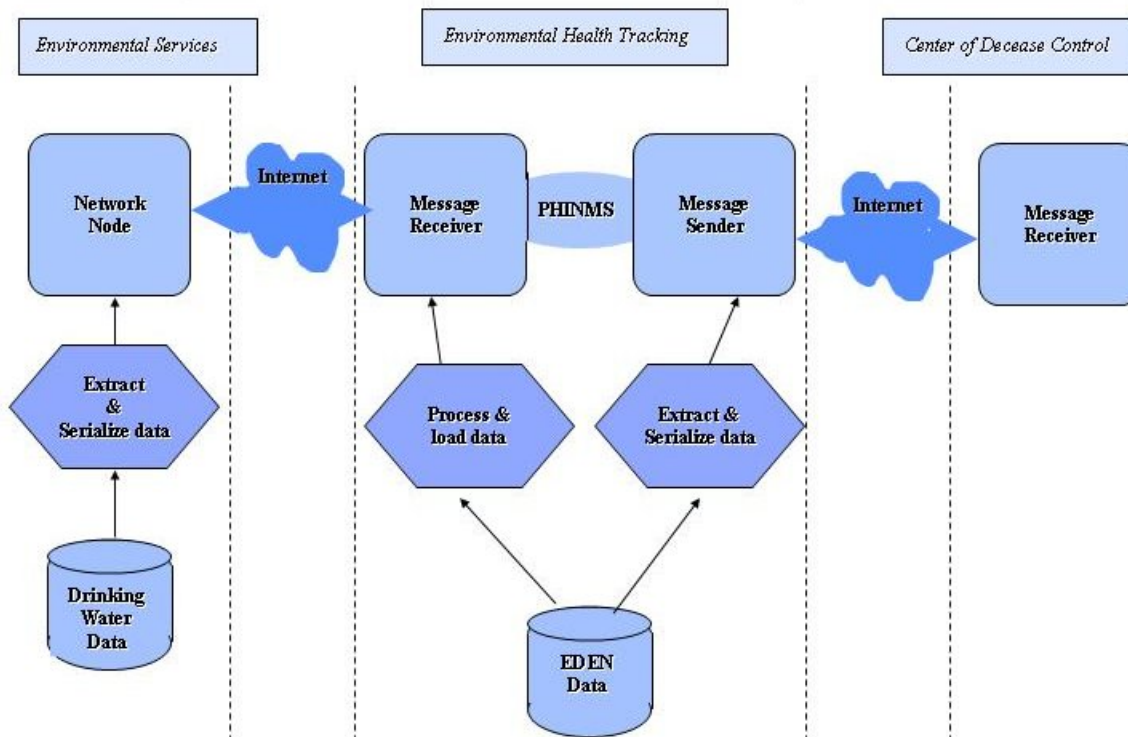
The objective of this flow is to enable EHDIN system to request Drinking Water data from DES via a date range and automatically flow the data back to EHDIN system.

- Then EHDIN will have the ability to access real-time data from the NHDES
- EHDIN will have a high level of flexibility in specifying the criteria for querying the data
- The data will be received by EHDIN in the desired format thereby eliminating the need for data conversion before actually using the data
- The ability to access data from NHDES will not be dependant on the availability and/or performance of One-Stop site
- The proposed data exchange process will enhance EHPIN capabilities for protecting the health of the citizens of New Hampshire
- The proposed data exchange process also results in saving resources by eliminating the need for data conversion.

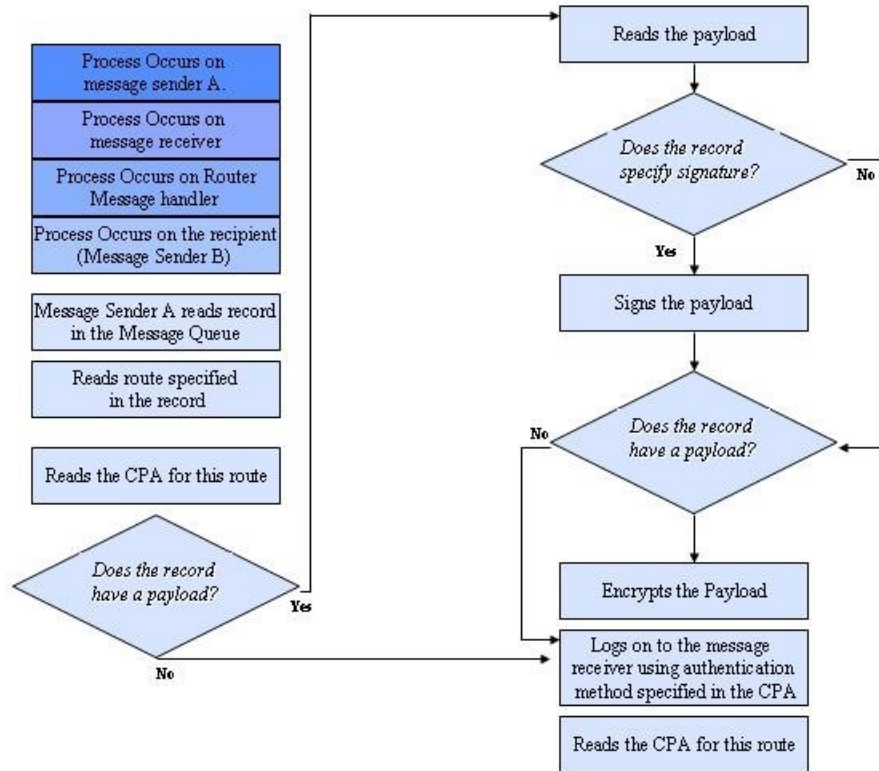
Proposed flow between Departments



Proposed Data Exchange between DES & EDIN Systems



Message sender A. sends a message to the message receiver



Ambulatory/ED Hospital Discharge File Layout

Field #	Name	Type	Size	Description
1	DOB	Date	8	Date of Birth
2	Sex	Number	Byte	Sex 1 Male 2 Female
3	ZIPCODE	TEXT	5	Residence 5 digit Zip Code XXXXXX Unknown YYYYYY Non-US
4	Hospital	Text	6	Hospital Identification number as assigned by HCFA 300001 Concord 300003 DHMC 300005 Lakes Region 300006 Huggins 300007 Monadnock 300008 Littleton 300009 New London 300010 Speare 300011 St. Joseph 300012 Elliot 300013 Franklin 300014 Frisbie 300015 Memorial 300016 Alice Peck Day 300017 Parkland Medical Center 300018 Wentworth-Douglas 300019 Cheshire 300020 SNHRMC 300021 Weeks 300022 Androscoggin 300023 Exeter 300024 Valley Regional 300028 Cottage 300029 Portsmouth 300033 UCV 300034 CMC 3000900 M.H. Psychiatric Unit
5	ADMITDT	Date	8	Admit Date
6	ADMITHR	Number	Byte	Admit hour 0 Midnight
7	DISCHDT	Date	8	Discharge date
8	DISCHHR	Number	Byte	Discharge hour 0 Midnight
9	LOS	Number	1	Length of stay in days 1 Less than full-day or full-day stay

Field #	Name	Type	Size	Description
10	DISPOSIT	Number	Byte	Patient disposition 1 Other short term hospital 2 Skilled nursing facility 3 Intermediate care facility 4 Structured/assisted living 5 Home, self care 6 Home health service 7 Against medical advice 8 Died 9 Transfer to Rehabilitation facility 10 Transfer to Rehab. in acute facility 11 Transfer to Substance abuse facility 12 Transfer to Subs. abuse in acute facility 13 Transfer to Psychiatric facility 14 Transfer to Psych. in acute facility 15 Redirected to appropriate provider (e.g., HMO request) 16 Patient left before treatment
11	PRINDX	Text	5	Principal diagnosis
12	SECDX1 – SECDX9	Text	5	Secondary diagnosis #1 - #5 ICD9-CM Code, implied decimal point
21	ECODE	Text	6	Cause of injury in Principal Diagnosis
22	PRINPROC	Text	4	ICD9-CM Code, implied decimal point Principal procedure ICD9-CM Code, implied decimal point
23	SECPROC1 - SECPROC5	Text	4	Secondary procedure
28	PRPROCDT	Date	8	ICD9-CM Code, implied decimal point Principal procedure
29	SPROC1DT - SPROC5DT	Date	8	Secondary procedure #1
35	HCFADRG	Number	Integ	HCFA DRG in effect on discharge
36	PRIPAYOR	Number	Byte	Primary payor source 1 Self pay 2 Workers compensation 3 Medicare 4 Medicaid 5 HMO 6 Other government 7 Blue Cross 8 Commercial insurance 9 Other 10 Medicare Managed Care 11 Medicaid Managed Care
37	CHARGE	Number	Long	Total charges 9999999 Over \$9,999,999

Field #	Name	Type	Size	Description
38	CHARGENT	Number Long		9999999 Over \$9,999,999
39	ATENDDOC	Text	6	Attending physician HCFA UPIN or if no UPIN: NPP000 non-physician OTH000 other PHS000 Public health service RES000 Intern/Resident RET000 retired VAD000 Military/VA
40	OPDOC1	Text	6	Operating physicians (Surgeons) #1
41	OPDOC2	Text	6	Operating physicians (Surgeons) #2
42	OPDOC3	Text	6	Operating physicians (Surgeons) #3
43	OPDOC4	Text	6	Operating physicians (Surgeons) #4
44	OPDOC5	Text	6	Operating physicians (Surgeons) #5
45	OPDOC6	Text	6	Operating physicians (Surgeons) #6
46	MRN	Text	9	Medical record or patient account
47	UNIQUEID	Text	10	Encrypted Social Security number
48	PTYPE	Text	1	Type of patient (Beginning with 1999) A Ambulatory Surgery E Emergency Room O Observation X Other

INVENTORY

Water System Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
PWS TYPE		Required	Alpha	4
PWS NAME		Required	Alphanumeric	80
ACTIVITY FLAG		Required	Alpha	1
DEACTIVATION DATE		conditional	Date	8
WHOLESALE ROF WATER		Optional	Alphanumeric	1
RETAIL POPULATION SERVED		Required	Numeric	8
RETAIL SERVICE CONNECTIONS		Required	Numeric	7
NON-COMMUNITY SEASON BEGIN (MONTH and DAY)		Conditional	Date	8
NON-COMMUNITY SEASON END (MONTH and DAY)		Conditional	Date	8
OWNER TYPE		Required	Alphanumeric	1

Legal Entity Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
ADDRESS ID		Required	Alphanumeric	20
ORGANIZATION		Conditional	Alphanumeric	80
ADDRESS NAME		Conditional	Alphanumeric	70
ADDRESS LINE 1		Required	Alphanumeric	50
ADDRESS LINE 2		Optional	Alphanumeric	50
CITY		Required	Alphanumeric	40
US STATE AND CANADIAN PROVINCE CODE		Conditional	Alpha	2
COUNTRY CODE		Required	Alpha	2
POSTAL CODE		Conditional	Alphanumeric	14
INTERNATIONAL POSTAL CODE		Conditional	Alphanumeric	14
TELEPHONE NUMBER		Optional	Alphanumeric	15
TELEPHONE EXTENSION NUMBER		Optional	Alphanumeric	5
FAX NUMBER		Optional	Alphanumeric	15
ELECTRONIC ADDRESS		Optional	Alphanumeric	100

Legal Entity Affiliation Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
ADDRESS ID		Required	Alphanumeric	20
PWS ID		Required	Alphanumeric	9
FACILITY ID		Optional	Alphanumeric	12
AFFILIATION TYPE		Required	Alpha	2

Service Area Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
PRIMARY SERVICE AREA CODE		Required	Alphanumeric	2
SERVICE AREA CODE		Optional	Alphanumeric	2

Geographic Area Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
US STATE CODE	many	Conditional	Alphanumeric	2
CITY NAME	many	Conditional	Alphanumeric	40
FIPS COUNTY CODE	many	Conditional	Alphanumeric	5
TRIBAL CODE	many	Conditional	Alphanumeric	3
SERVICE AREA ZIP CODE	many	Optional	Numeric	5

Water System Facility Source Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID		Required	Alphanumeric	12
ACTIVITY FLAG		Required	Alpha	1
DEACTIVATION DATE		Conditional	Date	8
FACILITY NAME		Required	Alphanumeric	80
STATE DATABASE FACILITY ID		Optional	Alphanumeric	40
FACILITY TYPE CODE		Required	Alphanumeric	2
FACILITY WATER TYPE CODE		Required	Alphanumeric	2
AVAILABILITY		Required	Alphanumeric	1
SELLER PWS ID		Conditional	Alphanumeric	9
SELLER SOURCE TREATMENT CODE		Optional	Alphanumeric	1
SOURCE TREATMENT CODE		Optional	Alphanumeric	1
REPORTED FILTRATION STATUS CODE		Optional	Alphanumeric	3

Water System Facility Treatment Plant Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID		Required	Alphanumeric	12
ACTIVITY FLAG		Required	Alpha	1
DEACTIVATION DATE		Conditional	Date	8
FACILITY NAME		Required	Alphanumeric	80
STATE DATABASE FACILITY ID		Optional	Alphanumeric	40
FACILITY TYPE CODE		Required	Alphanumeric	2

Water System Facility Other Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID		Required	Alphanumeric	12
ACTIVITY FLAG		Required	Alpha	1
DEACTIVATION DATE		Conditional	Date	8
FACILITY NAME		Required	Alphanumeric	80
STATE DATABASE FACILITY ID		Optional	Alphanumeric	40
FACILITY TYPE CODE		Required	Alphanumeric	2

Facility Flow Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID FLOW FROM	many	Required	Alphanumeric	12
FACILITY ID FLOW TO	many	Required	Alphanumeric	12

Treatment Data Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID		Required	Alphanumeric	12
TREATMENT ID		Required	Alphanumeric	20
TREATMENT OBJECTIVE		Required	Alphanumeric	1
TREATMENT PROCESS		Required	Numeric	3
TREATMENT COMMENT		Conditional	Alphanumeric	2000

Locational Detail Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
FACILITY ID		Required	Alphanumeric	12
LATITUDE DEG:MINS:SECS		Required	Alphanumeric	13
LONGITUDE DEG:MINS:SECS		Required	Alphanumeric	13
LATITUDE MEASURE		Required	Numeric	10
LONGITUDE MEASURE		Conditional	Alphanumeric	10
HORIZONTAL COLLECTION METHOD		Required	Alphanumeric	3
HORIZONTAL ACCURACY MEASURE		Required	Numeric	7
REFERENCE POINT CODE		Required	Alphanumeric	3
HORIZONTAL REFERENCE DATUM CODE		Required	Alphanumeric	3
SOURCE MAP SCALE		Required	Alphanumeric	2
GEOMETRIC TYPE CODE		Required	Alphanumeric	3
DATA COLLECTION DATE		Optional	Date	8
COORDINATE DATA SOURCE CODE		Optional	Alphanumeric	3
VERIFICATION METHOD CODE		Optional	Alphanumeric	3
VERTICAL MEASURE		Conditional	Numeric	7
VERTICAL COLLECTION METHOD CODE		Optional	Alphanumeric	3
VERTICAL ACCURACY MEASURE		Optional	Numeric	7
VERTICAL REFERENCE DATUM CODE		Optional	Alphanumeric	3
LOCATION COMMENT TEXT		Optional	Alphanumeric	150

ACTIONS

Violation Objective

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Require	Alphanumeric	9
Facility ID		Optional	Alphanumeric	12
Violation ID		Required	Alphanumeric	20
Violation Type		Require	Alphanumeric	2
Contaminant Code		Conditional	Alphanumeric	4
Compliance Period Begin Date		Required	Alphanumeric	6
Compliance End Date		Conditional	Alphanumeric	6
Analysis Result		Conditional	Numeric	15
Level Violated		Conditional	Numeric	15
Major Violation Indicator		Conditional	Alphanumeric	1
Public Notice Underlying Violation ID		Conditional	Alphanumeric	20
Severity Indicator count		Optional	Numeric	3

Enforcement Action Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
ENFORCEMENT ID		Required	Alphanumeric	20
ENFORCEMENT DATE		Required	Date	8
ACTION CODE		Required	Alphanumeric	3
ENFORCEMENT COMMENT		Required	Alphanumeric	2000
ASSOCIATED J5000 GROUP	many	Optional	Alphanumeric	0
ASSOCIATED VIOLATION IDS (Y5000)	many	Required	Alphanumeric	2

Assignment Criteria Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
ASSOCIATED VIOLATION IDS		Required	Alphanumeric	12
ASSOCIATED J5000 GROUP		Required	Alphanumeric	0

Event Schedule Activity Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
EVENT ACTIVITY ID		Required	Alphanumeric	20
ACTIVITY TYPE CODE		Required	Alphanumeric	40
ACTIVITY END DATE		Conditional	Date	8
ACTIVITY ACTUAL DATE		Required	Date	8
REASON CODE		Conditional	Alphanumeric	5
ACTIVITY COMMENT		Optional	Alphanumeric	2000

Site Visit Object

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
Visit ID		Required	Alphanumeric	20
Visit Date		Required	Date	8
Visit Reason		Required	Alphanumeric	4
Visit Agency Type		Required	Alphanumeric	2
Category Evaluation Management and operations		Optional	Alphanumeric	1
Category Evaluation source		Optional	Alphanumeric	1
Category Evaluation Security		Optional	Alphanumeric	1
Category Evaluation Pumps		Optional	Alphanumeric	1
Category Evaluation other		Optional	Alphanumeric	1
Category Evaluation operator compliance		Optional	Alphanumeric	1
Category evaluation monitoring reporting data verification		Optional	Alphanumeric	1
Category evaluation Treatment		Optional	Alphanumeric	1
Category evaluation Finished water storage		Optional	Alphanumeric	1
Category evaluation distribution		Optional	Alphanumeric	1
Site Visit Comment		Optional	Alphanumeric	2000

SAMPLE

Sample Objective

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
PWS ID		Required	Alphanumeric	9
Sample Id		Required	Alphanumeric	20
Facility ID		Conditional	Alphanumeric	12
Sample Begin Date		Conditional	Date	8
Sample End Date		Conditional	Date	8
Sample Collection Date		Conditional	Date	8
Source Type		Conditional	Alphanumeric	3
Qty Composited		Optional	Numeric	1
Sample Type		Conditional	Alphanumeric	1
Sampling Reconciliation ID		Optional	Alphanumeric	40

Sample Result Objective

<i>Element Name</i>	<i>Cardinality</i>	<i>Optionality</i>	<i>Domain</i>	<i>Length</i>
SAMPLE CONTAMINANT		Required	Alphanumeric	4
SAMPLE ANALYSIS METHOD		Optional	Alphanumeric	5
SAMPLE RESULT SIGN		Conditional	Alphanumeric	1
SAMPLE ANALYSIS RESULT		Required	Numeric	15
UNIT OF MEASURE		Conditional	Alphanumeric	4